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Chronic Myelomonocytic Leukemia Causes, Risk Factors, and Prevention

Risk Factors

A risk factor is anything that affects your chance of getting a disease such as cancer. Learn more about the risk factors for chronic myelomonocytic leukemia.

- [What Are the Risk Factors for Chronic Myelomonocytic Leukemia?](#)
- [Do We Know What Causes Chronic Myelomonocytic Leukemia?](#)

Prevention

There is no way to prevent most cases of CMML. Rarely, CMML is caused by chemotherapy and radiation treatments for other cancers. Doctors are studying ways to minimize the risk for patients receiving these treatments by avoiding the chemotherapy drugs that are more likely to lead to CMML.

What Are the Risk Factors for Chronic Myelomonocytic Leukemia?

A risk factor is anything that changes your chance of getting a disease such as cancer. Different cancers have different risk factors. For example, exposing skin to strong sunlight is a risk factor for skin cancer. Smoking is a risk factor for lung cancer and many other cancers. But people without any risk factors can still get the disease. And

having a risk factor, or even several, does not mean that you will get the disease. Because chronic myelomonocytic leukemia (CMML) is rare, it has been hard to study. For a long time it was grouped with [myelodysplastic syndrome](#)¹s. As a result, only a few risk factors are known for this disease.

Age

The risk of CMML increases with age. This disease is rare in those younger than 40, with most cases found in people 60 and older.

Sex

CMML is about twice as common in men as in women.

Cancer treatment

Prior treatment with [chemotherapy](#)² seems to increase the risk of CMML. The risk of CMML after cancer chemotherapy, however, is not as high as the risk of other blood problems, such as myelodysplastic syndromes and acute myeloid leukemia. [Second Cancers in Adults](#)³ has more information on this.

Hyperlinks

1. www.cancer.org/cancer/myelodysplastic-syndrome.html
2. www.cancer.org/treatment/treatments-and-side-effects/treatment-types/chemotherapy.html
3. www.cancer.org/treatment/treatments-and-side-effects/physical-side-effects/second-cancers-in-adults.html

References

See all references for Chronic Myelomonocytic Leukemia
(www.cancer.org/cancer/chronic-myelomonocytic-leukemia/references.html)

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Do We Know What Causes Chronic Myelomonocytic Leukemia?

Some cases of chronic myelomonocytic leukemia (CMML) are linked to cancer treatment, but in most cases the cause is unknown.

Over the past few years, scientists have made progress in understanding how certain changes in the DNA of bone marrow cells may cause CMML to develop. DNA is the chemical that carries the instructions for nearly everything our cells do. We usually look like our parents because they are the source of our DNA. However, DNA affects more than the way we look.

Some genes (parts of DNA) control a cell's growth and division process. Genes that promote cell division are called *oncogenes*. Other genes called *tumor suppressor genes* can slow down cell division or even make cells die at an appropriate time. Cancers can be caused by DNA mutations (gene defects) that turn on oncogenes or turn off tumor suppressor genes.

In some diseases, mutations may be passed down from a parent. Inherited mutations do not seem to cause CMML. Instead, the mutations are acquired during the person's lifetime. Exposure to radiation or cancer-causing chemicals can cause mutations that lead to CMML. Sometimes these gene changes occur for no apparent reason. Every time a cell prepares to divide into 2 new cells, it must copy its DNA. This process is not perfect, and copying errors can occur. Fortunately, cells have repair enzymes that read and fix DNA. However, some errors may slip past, especially if the cells are growing rapidly.

Human DNA is packaged in 23 pairs of chromosomes. In up to half of patients, CMML cells contain altered chromosomes. Sometimes part of one chromosome attaches to a different chromosome. This is called a *translocation*. Like mutations, translocations can turn on oncogenes or turn off tumor suppressor genes. Acquired translocations are seen in some cases of CMML. Another chromosome abnormality that can be seen in CMML is called a deletion. This involves the loss of all or part of a chromosome. Another type of chromosome abnormality is called a *duplication*. This is when there is an extra copy of all or part of a chromosome.

References

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Can Chronic Myelomonocytic Leukemia Be Prevented?

Since most cases of chronic myelomonocytic leukemia (CMML) have no known cause, this disease can rarely be prevented.

Treating cancer with chemotherapy and radiation may cause CMML. Doctors are studying ways to minimize the risk of CMML developing in patients receiving these treatments. In some cancers, doctors may try to avoid using the chemotherapy drugs that are more likely to lead to CMML. For certain cancers, however, these drugs may be needed. Often, the obvious benefits of treating life-threatening cancers with chemotherapy and radiation therapy must be balanced against the small chance of developing CMML several years later.

References

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